Research on the Practical Pathways of AI-Enabled Curriculum Restructuring for Higher Vocational E-commerce Majors

Liyun Cao[1]

[1] *Guangxi Vocational College of Economics and Trade, Nanning 530000, China*

ABSTRACT

As generative artificial intelligence (AI) technology deeply permeates the entire e-commerce value chain, the talent demand in the e-commerce industry is undergoing a transformation from "digitalized operation" to "intelligent operation," imposing systematic restructuring requirements on the knowledge structure and competency specifications of higher vocational e-commerce talent cultivation. Currently, the curriculum system of higher vocational e-commerce majors faces structural contradictions, including teaching content lagging behind technological iteration, misalignment between curriculum structure and job competency requirements, and disconnection between practical training scenarios and real business operations. Grounded in the competency-based orientation of vocational education, this study takes industry-education integration as the overarching thread and situational learning theory as the theoretical support to define the core connotation and theoretical framework of generative AI-enabled curriculum restructuring. Taking the e-commerce professional cluster of Guangxi Vocational College of Economics and Trade as the research subject, this study constructs a goal framework for curriculum restructuring from four dimensions: curriculum structure, curriculum content, practical training scenarios, and evaluation system. It embeds frontier content such as AI tool application and big data thinking into core courses and ensures implementation effectiveness through industry-education integration mechanisms, providing transferable practical pathways for AI-enabled curriculum reform in e-commerce majors at higher vocational colleges.

Keywords: *Higher vocational education, E-commerce, Curriculum restructuring, Industry-education integration.*

1. INTRODUCTION

In recent years, generative artificial intelligence technologies, represented by DeepSeek and Jimeng AI, have been driving profound transformations in the e-commerce sector. AI has permeated the entire value chain, including intelligent product selection, intelligent customer service, content generation, and data analysis. According to the 2025 Survey Report on AI-Enabled Chinese E-commerce Talent released by the China E-commerce Research Center in collaboration with Yingdong Education, AI capability has become a core requirement in e-commerce recruitment, with enterprises' recognition of employees' AI tool application proficiency rising sharply from 16.82% last year to 42.86%.

During the 2025 JD.com 618 shopping festival, over 14,000 intelligent agents were deployed, and Tmall's "image-to-video" system generated millions of video assets [1]. The demand for "AI tool application capability" has shifted from being a supplementary advantage to a "basic threshold" for job competency. The industry's demand is rapidly transitioning toward a human-machine collaboration model, and it is expected that by 2026, the field of e-commerce talent will be further reshaped.

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2. RESEARCH BACKGROUND AND SIGNIFICANCE

In recent years, AI technology has propelled the vocational education curriculum system into a substantive restructuring phase. At the policy level, the 2026 Opinions of the Ministry of Education on Deepening the Reform of Key Elements of Vocational Education Teaching established the reform direction of "guiding education by industry and leading education through industry." In the same year, Document No. 1 of the "Artificial Intelligence + Education" Action Plan proposed promoting the upgrading and transformation of traditional vocational education programs, requiring the scientific design of three types of "AI+" systems, enhancing program adaptability, and driving higher vocational colleges to collaborate with industry enterprises in cultivating high-skilled talent for emerging positions [2].

Curriculum system restructuring is a core component of education and teaching reform and a key lever for responding to industrial transformation and enhancing the adaptability of talent cultivation [3]. The e-commerce professional cluster at Guangxi Vocational College of Economics and Trade has already undertaken explorations in AI-enabled curriculum reform. This study takes industry-education integration as the main thread and the college as the carrier to construct a theoretical framework and practical pathway for generative AI-enabled restructuring of the e-commerce curriculum system, addressing the core problem of systematically restructuring the curriculum system to meet the demands of the AI era, and providing a pathway reference for teaching reform in higher vocational e-commerce programs.

3. THE GAP BETWEEN INDUSTRY DEMAND AND TALENT CULTIVATION

The skills needed for new e-commerce roles are shifting faster than the curriculum. Take livestream operations: practitioners now do real-time data analysis, plan audience interaction, and manage paid traffic in a single shift. A similar blend shows up in customer service roles, where staff must configure AI tools, train the underlying semantics, and redesign service workflows—work that used to be split across three departments. Even analytics roles have moved past spreadsheet reporting; they now expect BI tools, user profiling, and paid-media optimization from the same hire.

These skills are not taught as a coherent track. They are scattered across existing courses, and few go deep enough to build actual job competency.

The numbers from BOSS Zhipin's 2026 Talent Trends Report show where the pinch is. E-commerce companies report shortages in data analytics, algorithm roles, and cross-border functions, while job seekers concentrate in traditional entry-level positions. 82.3% of employers say key positions are hard to fill, especially roles that combine platform expertise, overseas marketing, and data skills. Cross-border e-commerce accounts for the largest gap—about 4 million people short in 2025—broken down into 350,000 in overseas livestream operations, 190,000 in cross-border compliance, and 150,000 in minority-language promotion.

The mismatch also differs by segment. Cross-border companies need people who can run international supply chains and promote products overseas. Rural e-commerce is a newer case: county-level positions are growing quickly as policy pushes the sector, but few graduates know how to move agricultural products from farms to online markets or build regional brands. In social commerce, private-domain traffic and community fission are already standard job titles, yet they do not appear in any curriculum.

A generic curriculum will not close these gaps. Each segment asks for different skills, so the response has to be segment-specific—moving away from a one-size-fits-all program toward a common base with specialized tracks.

4. CORE CONNOTATION OF GENERATIVE AI-ENABLED CURRICULUM SYSTEM RESTRUCTURING

This study's definition of "generative AI-enabled curriculum system restructuring" differs from the partial adjustment of merely adding AI tool modules to the existing curriculum. A complete curriculum restructuring should take the reshaping of e-commerce job competencies by AI technology as its logical starting point, with industry-education integration as the overarching thread, and conduct systematic redesign across three core dimensions: curriculum objectives, curriculum structure, and curriculum implementation [3].

In terms of curriculum objectives, the direction of restructuring is a shift from a "disciplinary

knowledge-based" to a "competency and literacy-based" approach. The core vehicle for this shift is the dual-dimensional competency model of "vocational competency + digital literacy." Its function is to precisely anchor the fundamental curricular question of "for whom and what kind of talent to cultivate" to the new competency requirements of e-commerce positions in the AI era, giving the objective-setting clear industrial orientation [4].

In terms of curriculum structure, the core of restructuring is to break the rigid curriculum framework traditionally organized by knowledge logic and transform it into a curriculum structure centered on job competency modules. This adjustment is not a simple reassembly of existing course units, but rather a re-articulation of the logical relationships among different competency modules based on the task restructuring of e-commerce positions following the intervention of generative AI. This ensures that curriculum offerings correspond to job workflows and enhances the curriculum system's adaptability to technological iteration and industrial demand changes.

In terms of curriculum implementation, the focus of restructuring is to transform the traditional one-way teaching model of "teacher lectures, student exercises" and create human-machine collaborative, immersive teaching scenarios powered by generative AI. On one hand, AI tools are easy to build practice carriers that combine virtual and real elements, allowing students to repeatedly practice AI application skills in simulated real e-commerce operation workflows. On the other hand, real projects from e-commerce enterprises are introduced, with joint process-based guidance from both school and enterprise mentors, promoting the transformation of knowledge acquisition into competency development and achieving a deep-level transition from "knowledge acquisition" to "problem solving."

5. PRACTICAL PATHWAYS OF GENERATIVE AI-ENABLED CURRICULUM RESTRUCTURING

This study takes the e-commerce professional cluster at Guangxi Vocational College of Economics and Trade as a case study, relying on the "Smart Agriculture and Tourism" industry-education integration practice project, and constructs practical pathways for curriculum system restructuring from four dimensions: curriculum structure, curriculum content, practical training scenarios, and evaluation system.

5.1 Curriculum Structure Restructuring

Building upon the existing curriculum system of "shared foundation at the base, specialized core in the middle, and elective expansion at the top," the e-commerce professional cluster collaborated with regional leading e-commerce enterprises, experts, and academic institutions to determine the proportional weights of each module through the Delphi method. Referencing the teaching content and standards for professional courses in the 2026 Vocational Education Professional Teaching Standards published by the Ministry of Education, the cluster constructed a "four-domain collaborative" curriculum structure (see “Table 1”).

Table 1. Curriculum structure

Course Structure	Core Content	Positioning
Foundation Professional Courses	E-commerce Fundamentals, Consumer Behavior Analysis, Internet Sales, Retail O2O, etc.	Build general e-commerce competency and professional literacy
Dynamic Core Courses	AI + Visual Marketing, AI Customer Service and Management, Short Video Production and Editing, Data-Driven Operations	Align with AI technology frontier; modular dynamic updates
Interdisciplinary Courses	Business Data Analysis, Big Data Thinking, Project Management, etc.	Cultivate cross-domain thinking and data literacy
Humanities and Literacy Courses	E-commerce Laws and Regulations, Critical Thinking Training, Introduction to Artificial Intelligence, etc.	Establish ethical baseline and compliance awareness

a Note: The above curriculum structure represents a partial selection of courses from the e-commerce professional cluster.

Foundation courses still follow the Ministry of Education's curriculum standards. The core module works differently. It is designed to change with industry, not stay fixed: enterprise partners review the skills their entry-level hires actually need, and course content is revised to match. The goal is to keep what students learn close to what employers ask for, rather than letting the curriculum fall behind as tools and roles shift.

5.2 Curriculum Content Restructuring

The team worked with leading regional e-commerce companies to identify what entry-level hires actually need. Beyond interviews and surveys, we used AI analysis tools to pull together regional supply and demand data and make it visible. The output was a Job Competency Model Map that can be revised as the market changes. For the E-commerce Operations Assistant role, the map breaks the job into concrete units: AI-assisted product selection, intelligent advertising, data insight, and AI-tool workflow. These units then drive how courses are organized.

The harder question was how to turn these units into actual syllabi. We used a three-level mapping: each competency unit is broken down into the knowledge and skills a course needs to cover, so the chain runs job competency → course module → knowledge node. The point is to keep teaching tied to real job tasks, rather than letting courses settle into outdated content.

5.3 Practical Training Scenario Restructuring

Real commercial practice is central to the training system. The on-campus livestream base is set up like a small e-commerce startup: each booth has the tools and layout of a real operations room, so students do not face a jarring switch when they leave the classroom.

AI tools have also changed what one person can do. In a traditional e-commerce operation, product selection, content, advertising, customer service, and analytics are split across several roles. Today, the same person can run all five with AI assistance. The "one-person company" is no longer a slogan—it is operationally realistic. This shifts the key skill from managing a team to choosing the right AI tool and applying it well.

Each student therefore launches a real store built around one of Guangxi's local specialty agricultural products, and runs it end to end. We track performance data, but the purpose is to follow each student's progress rather than rank them against peers. The store faces real customers, so students have to handle unexpected problems as they arise. This is actual commerce, not a classroom simulation.

5.4 Evaluation System Restructuring

The evaluation system has to match what the curriculum now aims to do. Since the goal has moved from testing disciplinary knowledge to building competency, relying on a single final exam no longer fits. We revised the evaluation on three fronts: content, who scores, and how scores are collected.

Content. Instead of testing theory alone, assessment now covers four indicators: theoretical knowledge, AI tool proficiency, hands-on data analysis, and project performance. Together they track both vocational competence and digital literacy.

Who scores. Through the school-enterprise collaboration [7], enterprise experts and industry mentors join the evaluation. Their standards match what the company actually expects on the job: they score students during practical training and review project outcomes jointly. This keeps grading aligned with real hiring criteria rather than with classroom conventions. It also works for the enterprise: classroom performance becomes a low-cost way to screen interns and future hires, while the school gets a clearer pipeline and students get an earlier route into jobs.

How scores are collected. Platforms such as Xuexitong (Chao Xing) log each student's learning behavior, operation path, and interim results across the semester, building a traceable portfolio. AI teaching assistants handle routine attendance and grading, and can flag where a student is stuck based on platform data, so teachers can adjust their pacing and guidance. Formative feedback and the final assessment are no longer separate steps.

The result is a composite system: AI records the process, school and enterprise mentors score together, and process plus outcome are weighed together [4].

5.5 Practical Outcomes

After the curriculum restructuring, the e-commerce cluster at Guangxi Vocational College of

Economics and Trade saw measurable gains in how well its graduates match what employers need. Its "Cross-Domain, Empowerment, Symbiosis" program was included in the 2025 Industry-Education Integration Excellent Case Library [5]. The main results are as follows:

Based on questionnaires recovered from students of the 2022–2025 cohorts in the e-commerce professional cluster, the proportion of students in the 2024 and 2025 cohorts who proactively obtained skill certificates in AI application and data analysis showed a substantial increase compared to the pre-reform 2022 and 2023 cohorts, reflecting the effective reshaping of students' skill structures through curriculum content updates. Meanwhile, students' comprehensive practical and innovation abilities have been fully validated in high-level competitions, with repeated achievements in the National Vocational College Skills Competition (Finance and Commerce category) and the "Challenge Cup" China College Student Entrepreneurship Plan Competition, demonstrating the advantages of the restructured curriculum system in cultivating students' ability to solve complex practical problems.

The innovative outcomes in program development have generated positive spillover effects. The curriculum restructuring plan and core experiences have been adopted and referenced by the e-commerce programs of multiple higher vocational colleges in the region. The relevant practice cases were successfully selected as provincial vocational education teaching achievement cultivation projects, affirming their exploratory value from the perspective of the national industry-education integration strategy. This provides a clear and operable practical pathway for similar commerce and trade programs nationwide on how to systematically align with AI technology upgrading and conduct in-depth curriculum system restructuring amid the wave of digital intelligence.

6. CONCLUSIONS AND PROSPECTS

6.1 Main Research Conclusions

This study examined how generative AI is reshaping vocational e-commerce curricula and what a workable restructuring path looks like. Three conclusions emerged.

First, generative AI does not merely add a tool to existing courses; it changes what the curriculum has to cover. The structure, content, training scenarios, and evaluation all have to move together, not one at a time. Restructuring should follow three principles: let technology serve the teaching goal, anchor the content in real industry needs, and treat the whole system as connected rather than patching individual courses. The shift is from transmitting knowledge to building competency. Technology should not drive the curriculum for its own sake; the point remains training people well.

Second, industry-education integration is what makes the reform concrete. Schools and companies co-develop AI training projects and share teaching materials that can be updated, which narrows the usual gap between classroom theory and workplace practice. A static curriculum cannot keep up with how fast e-commerce tools change, so the program needs a mechanism that revises content as the industry shifts [6]. This requires spelling out what each side—school and enterprise—does and how interests are shared, otherwise the collaboration does not last.

Third, the e-commerce cluster at Guangxi Vocational College of Economics and Trade shows that this approach works in practice. Graduates' skills align more closely with what employers need. The model is not meant to be copied wholesale, but it offers a concrete reference point for similar vocational colleges moving into AI-era teaching reform.

6.2 Limitations and Prospects

6.2.1 Research Limitations

Two limitations stand out. First, the reform was tested at a single institution's e-commerce program. Whether it transfers to other colleges needs to be shown. Second, generative AI moves quickly. The curriculum we built matches today's industry, but as new roles appear, the adjustment mechanism itself will need to keep being refined.

The next step is to work with colleges of different types and sizes, not just our own, and to deepen ties with leading e-commerce companies so that the competency tracking and curriculum updates stay current.

6.2.2 Research Prospects

Generative AI and e-commerce will keep changing, and the curriculum has to keep up. The hard part is that technology turns over faster than a

college can rewrite a syllabus. Future work should build faster feedback loops—signals from industry that actually trigger content changes, not just inform them.

Two directions stand out. One is breadth: study e-commerce programs across regions and college types, so the restructuring model is not just tuned to one setting. The other is evaluation: use the platform data we already collect to assess competency more precisely, rather than relying on grades and instructor judgment alone. That would let the curriculum reform itself be measured, not just assumed.

AUTHORS' INTRODUCTION

About the Author: Liyun Cao (1988—), female, Master's degree, Lecturer at Guangxi Vocational College of Economics and Trade. Research interests: E-commerce, Innovation and Entrepreneurship.

Recommender: Miao Li, Professor, Vice Dean of the School of Digital Economy and Artificial Intelligence, Guangxi Vocational College of Economics and Trade.

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